

S.2 AND 3 HOLIDAY PACKAGE

SUBJECT: PHYSICS (535/1)

INSTRUCTIONS

- ✓ Attempt this package throughout this holiday.
- ✓ On reporting, it is a MUST to present your work to the teacher

Item one

A Ugandan student got a scholarship to study in Canada. While there he got information that it will be totally dark during day time in some parts of Rwenzori region. He called back home at midday to alert his parents, the parents told him that they were already in bed and it was night time. These two occurrences bothered him so much why it was night in Uganda and day time in Canada, why it was going to be totally dark during day time only in Uganda.

As a learner physics help him to understand

- i) How it is possible for some place to experience total darkness during day time
- ii) How it can be night time in one place and day time in another place.

Item two

A woman of mass 65kg is carrying a basket of food items of 15kg from her garden. She climbed a hill of vertical height 80m and reached her home at the top of the hill in 20 minutes. On reaching home she was sweating and breathing heavily.

Hint: Acceleration due to gravity = 10ms^{-2}

Task:

As a learner of physics

- a) Explain what caused a change in the breathing rate and sweating
- b) Determine
 - (i) Her ability to do work
 - (ii) Her personal power developed.

Item three

A group of tourists set off from the bottom of a mountain to climb up to the peak of the mountain. However, on the peak of the mountain they all complained of difficulty in breathing and eventually experienced nose bleeding. All of the sudden everyone picked up a heavy jacket

and put it on. On using a mercury barometer, a barometric height of 71cm was measured. **Hint:** Density of mercury 13600 kg m^{-3}

Task

Using your knowledge of physics, Explain why they;

- (i) Experienced difficulty in breathing and nose bleeding
- (ii) Had to put on heavily jackets.
- (iii) What is the pressure at the peak of the mountain?

Item four

Mrs. Mwesige started a small-scale shop in a trading to sell soft drinks packed in plastic and glass bottles. She uses a fridge to make them cold. One evening, she mixed all the products in her fridge and left the fridge on; as she opened her fridge the following day most of the glass bottles were broken and others with cracks while the plastic bottle had expanded. She called her neighbor to help her understand what had happened but none of them could explain what had happened.

Task

As a learner of physics;

- a) Help Mrs. Mwesige to understand what had happened
- b) Suggest ways how to avoid this from happening again to her

Item five

One Monday afternoon it rained heavily and a heavy thunder destroyed and split one of the tallest trees in the compound into pieces. On hearing the news, the parents in the community decided to take their children to other schools thinking that the school has been attacked by evil spirits. This forced the PTA chairperson to call a parents' meeting to discuss this issue.

support



Task

Using your knowledge of physics, help the chairperson with;

- a) Information about what happened
- b) A suggestion of a device that can be used to avoid the re- occurrence of this event and how it works.

Item six

A group of new students agreed to go to revise their books from the South field of the school. After long hours of revision, they could not remember their direction back to the classroom. Looking around the room they saw a long un insulated copper wire, battery cells, switch, a long steel nail, piece of thread and retort stand

Task

Using your knowledge of physics help them:

- a) To come up with a device that can help them to find their way back to classroom
- b) On how they use this device to locate their classroom

Item seven

One of the most misunderstood branches of physics for many years has been space physics (Astronomy). Some of the examples of such misunderstandings include the following. The Catholic Church at one time thought that other heavenly bodies, including the sun, orbited around the earth, rather than the earth. This was the problem that Catholic hierarchy had with Galileo. For example, the Church tried and arrested Galileo for supporting Sun-centered view of the universe.

While watching the world cup which took place in Brazil in 2014 at 9pm East African time, the football fans watching the game in East Africa realized that it was still daytime in Brazil, some of them were puzzled by this?

While it snows (winter) in most European countries in December around Christmas season, the people in East Africa have never seen any snow fall in East Africa and some of them wondered why it is this way?



Task

As a learner of physics,

Write a report to the community on enlightenment about these astronomical events in order to promote deeper understanding of physics in the school and community at large.